Fungicide resistance screening of a *Botrytis cinerea* population from Australian vineyards

Ismail Ismail[1,2] , Lincoln Harper[3], Francisco J. Lopez-Ruiz[3], Danièle Giblot-Ducray[1,2] and Mark Sosnowski[1,2]

[1] South Australian Research and Development Institute (SARDI), Plant Research Centre, Urrbrae 5064, South Australia, Australia, [2]School of Agriculture, Food and Wine, Waite Research Institute, The University of Adelaide, South Australia, [3] Centre for Crop and Disease Management (CCDM), School of Molecular and Life Sciences, Curtin University Bentley, WA, Australia

Background

Botrytis cinerea, which causes botrytis bunch rot, is one of the most important grapevine diseases. Fungicides are integral for the control of *B. cinerea.* Resistance to most single-site fungicides is geographically widespread. In this study, phenotypic and genotypic resistance screening was undertaken on a population of *B. cinerea* isolates.

Methods

504 isolates were collected between 2020 – 2024 from 53 vineyards across WA, SA, Vic, NSW and the ACT. Isolates were screened on discriminatory concentrations of fungicides from FRAC groups 9, 12 and 17. Resistance associated genes *Pos5* (group 9), *Mdl1* (group 9) and *Erg27* (group 17) were screened.

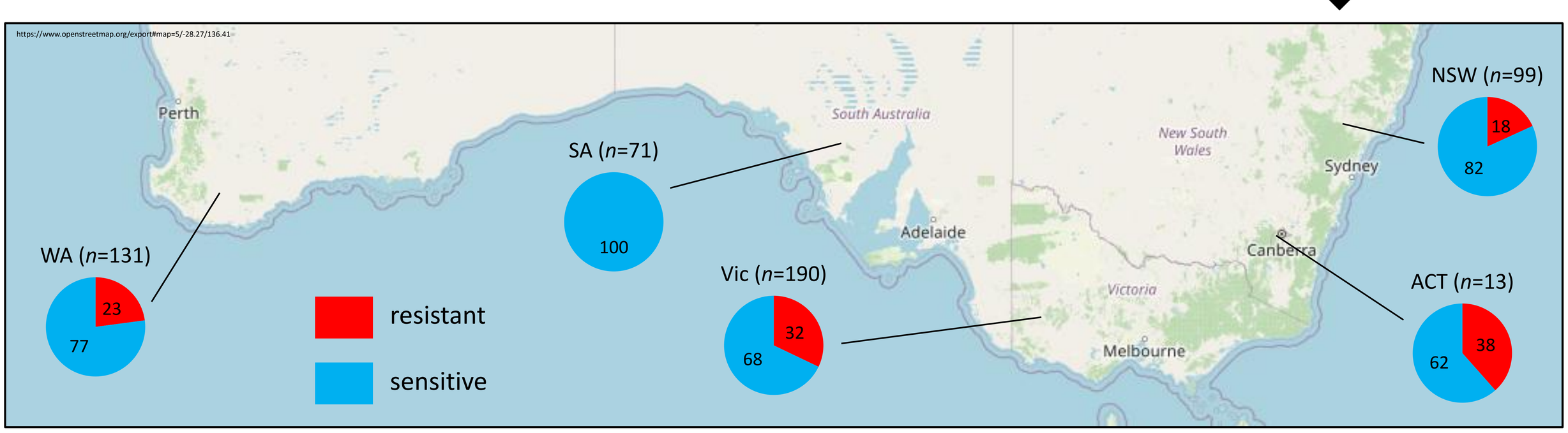

Fig. 1. Total resistance frequencies for WA, Vic, NSW and ACT. *n* indicates number of isolates tested. Red indicates resistance, blue indicates sensitive.

Results

Total resistance frequencies for WA, SA, Vic, NSW and ACT were 23, 0, 32, 18 and 38%, respectively (Fig. 1). Total (national) resistance frequencies per fungicide were 14.5, 9.7 and 8.7% for group 9, 12 and 17, respectively (Fig. 2). Most isolates were resistant to group 9 only, group 12 only or both group 9 and 17 simultaneously (Fig. 3a). In *Pos5* and *Mdl1*, the changes V273I, P293S, P319A or L142F/V and E407K or G408V were identified, respectively (Fig. 3b). In *Erg27*, the changes F412C/I/S/V were found (Fig. 3c). The predominant genotypes for group 9 and 17 resistance were L412F and F412S, respectively (Fig. 3b-c).

Fig. 2. Total resistance frequencies per fungicide group (*N* = 504 isolates)

Fig. 3. Frequency of single and multi-resistance phenotypes in resistant isolates (*n*=115) (a). Frequency of group 9 (b) and group 17 (c) associated genotypes

Conclusions

These results provide valuable information on the resistance status of *B. cinerea* in Australian vineyards and could assist in improving resistance management strategies. Further monitoring of resistance to critical Botryticidal chemistry is essential to improving current resistance management strategies.

Acknowledgements - this research is a Wine Australia and CRC SAAFE investment

Lincoln.harper@curtin.edu.au